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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Qing Yang

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EXAMINER

GU, SHAWN X

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/693,077	Applicant(s) YANG, QING	
	Examiner Shawn X. Gu	Art Unit 2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25,26,30,31,37,41,42 and 44-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25,26,30,31,37,41,42 and 44-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This final Office action is in response to the remarks filed 2 October 2008. Claims 25, 26, 30, 31, 37, 41, 42 and 44-46 are pending. Claims 1-24, 27-29, 32-36, 38-40 and 43 have been cancelled. All objections and rejections not repeated below are withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 25, 26, 30, 31, 37, 41, 42 and 44-46 are rejected under 35 U.S.C. 102(e) as being anticipated by Carter et al. [6,148,377] (hereinafter "Carter").

Per claims 25, 37, 44, 45 and 46, Carters teaches an information backup system (Computer Network 10, Fig.1; for backup, see "replication" in col.10, ln.25-40, "fault-tolerant" in col.2, ln.54-55; also tape, disk, and RAID mentioned in col.3, ln.35-40 all imply a backup system) comprising:

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a plurality of computer systems to be communicatively coupled to a communication network (Nodes 12a-c and Network 38, Fig.1 and 2; Col.5, Ln.60-67; also see Network 10 in Fig.1 and Col.6, Ln.1-11), each including a disk subsystem (Fig 2, 36a, 36b and Network Disk 20, see col.7, ln.1-8) and a network interface (Fig 3, 52, and col.9, ln.57), wherein each computer system is configured to generate disk I/O requests and to direct said disk I/O requests to said network interface (see Figs 3, 4 and 7, also see col. 10, lines 58-67, col. 11, lines 1-67 and col. 14, lines 23-50; the disk I/O requests are the Requests 112 that request pages stored in persistent/disk storage), said network configured to communicate said disk I/O requests and data associated with said disk I/O request among said plurality of computer systems (see network shown in Figs 1-4; also see col. 2, lines 25-29, col. 6, lines 45-67 and col. 7, lines 1-8);

a distributed cache memory (combination of local RAM caches 34a-c, see Fig.2 and Col.10, Ln.25-41) comprising a plurality of memory portions, each memory portion being a portion of a memory of a computer system among said computer systems, said memory portions being organized to function as a single coherent cache memory (the local RAM caches 34a-c serve as a single coherent cache for the shared memory space and the operation system 16, Col.7, Ln.18-38, Col.8, Ln.12-27, Col.10, Ln.25-41, Col.12 Ln.29-55); and

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a distributed disk storage device (combination of RAID Disks 36a-c, see Fig.2 and col.3, ln.39-41) comprising a plurality of disk storage portions, each disk storage portion being a portion of a disk storage (Col.2, Ln.49-53) of one or more computer systems among said plurality of computer systems, said disk storage portions being organized to function as a single disk storage device (shared memory space and global address, see Fig.6, Col.7, Ln.18-52, Col.8, Ln.28-47, Col.12, Ln.30-55), wherein said computer systems access said distributed disk storage device as a single logical disk (see Figs, 3, 4 and 7, also see col. 10, lines 58-67, col. 11, lines 1-67 and col. 14, lines 23-50) by generating disk I/O requests (Requests 112 that request pages stored in persistent/disk storage, see Fig. 4) and wherein any portion of said distributed cache memory is accessible to any computer system (see col. 2, lines 21-29, "actual physical location of the data can be in any of the memory devices connected to the network"; it is clear from this statement that any computer in Carter's invention can access any one of the memory devices, including the local RAM devices that form the shared global memory space as describe above; it is also clear that Carter teaches a global address space that span across both the local RAM devices and the local disk devices by employing a global disk directory 84 and a global RAM directory 80, any portion of any memory device in the global address space is accessible to any computer connected to Carter's network, see Col.7, Ln.18-38, Col.8, Ln.12-27, Col.10, Ln.25-41, Col.12 Ln.29-55; furthermore, the fact that a local RAM is used by a computer on the node where it is physically located does not preclude this local RAM to be accessible by computers residing on other nodes, although Carter teaches global address directories and

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operating systems must be utilized to locate the remote memory device that physically stores the data requested by a computer, it remains true that the remote memory device is accessible to a computer requesting data stored on the remote memory device, even if the access is not a direct access with no intermediate components facilitating the access, otherwise the requested data cannot possibly be retrieved by the computer) with a bridge driver connected to the network independent of the computer system's location, and said distributed disk storage device is to be accessible to any computer system with a bridge driver connected to the network independent of the computer system's location (a bridge driver is broadly interpreted as any device/component that couples Carter's local node's memory and disk portions to the local node's network interface, such device/components include buffers, disk caches, I/O ports and any other devices that perform similar functionalities, it would also include the operation system; furthermore, it has already been established as set forth above that each of Carter's computer systems can access the shared global memory space) and the distributed cache memory is to be operable as a cache memory for said distributed data storage device (each local RAM cache serves as data cache for requested pages of the shared memory space which consists of the RAID disks 36a-c; see col. 12, lines 41-45), the bridge driver is for communications between its associated network interface and its associated disk subsystem and memory portion (a bridge driver is broadly interpreted as any device/component that couples Carter's local node's memory and disk portions to the local node's network interface, such device/components include buffers, disk caches, I/O ports and any other devices that perform similar functionalities).

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It is clear that claims 25, 37, 44, 45 and 46 are already substantially described as set forth above.

It is also clear that for claims 45 and 46, the first set of said computer systems is taught by Carter as Nodes 12a-12c, and Carter further teaches RAM memory (RAM, see Col.2, Ln.49-53, Col.3, Ln.22-40; Col.10, Ln.8-24).

Per claim 26, Carter further teaches said functionally coherent and physically distributed cache memory is to operate as a data cache for said functionally coherent and physically distributed disk storage device (each local RAM cache serves as data cache for requested pages of the shared memory space which consists of the RAID disks 36a-c; see col. 12, lines 41-45).

Per claims 30 and 41, Carter further teaches said functionally coherent and physically distributed disk storage device is to be configured as a functionally coherent and physically distributed RAID storage device (RAID, see Col.3, Ln.38-40).

Per claims 31 and 42, Carter further teaches said memory portions comprise portions of volatile random access memories of said plurality of computer systems (RAM, see Col.2, Ln.49-53, Col.3, Ln.22-40; Col.10, Ln.8-24).

Response to Arguments

4. Applicant's arguments regarding claims 25, 26, 30, 31, 37, 41, 42 and 44-46 have been considered but they are not persuasive. The claims are taught by Carter as set forth above.

Regarding the Applicant's arguments on pages 4-5 of the Remarks that Carter does not teach a bridge driver for communications between a computer system's associated network interface and its associated disk subsystem and memory portion, and wherein any portion of said distributed cache is to be accessible to any computer system with a bridge driver connected to the network, independent of the computer system's location, the Examiner points that it has been explained clearly in the rejection of the independent claims set forth above that Carter teaches a computer storage network that forms a global distributed cache that is accessible to every computer comprised within the network to form the global storage space, each computer containing its own local disk subsystem and memory portion.

In absence of any clear definition that defines the structure of a "bridge driver" as claimed, the term can only be interpreted in terms of its functionalities. In the claims, a bridge driver is for communications between a computer system's network interface and the computer's associated disk subsystem and memory portion, and any computer with a bridge driver that connects it to the network can access a distributed cache regardless of the computer's location. Therefore, a bridge driver's only function is to communicate a network interface to a disk subsystem and memory portion, and to exist on a computer that can access a distributed cache.

Although Carter already teaches components that resemble a bridge driver in terms of functionality, as seen in Figures 3 and 4, the Examiners contends that a bridge driver can be broadly interpreted as any device/component that enables communication between Carter's local node's memory and disk portions to the local node's network

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interface, such device/means include buffers, disk caches, I/O ports and any other devices that perform similar functionalities, and it should be clear that such devices/components must be present at each local node in Carter's invention. In other words, whatever means in Carter that enables each computer on a local node to access the global distributed address space including the global distributed cache, and enable each computer's local disk and memory portions to be accessed by remote accesses from other local nodes must be the bridge driver, because accessing remote storage is a form of communication. Whether Carter explicitly mentions "buffers, disk caches, I/O ports" is irrelevant, they are only listed as a few well-known examples in the art. What is undeniable and must be true for Carter's invention to even be operable and enabling, is that there must be some device or means that exists in each of Carter's local node's computer to enable remote accesses from remote nodes to access the local node's associated disk and memory portions, thereby enabling Carter's local nodes to access the global address space containing the distributed cache by communicating remotely to remote nodes. Whatever this device or means may be in Carter, it is the bridge driver, because as the bridge driver does in the claimed invention, this device or means enables communication between Carter's computer network interface to the computer's associated disk and memory portions, and exists on each of Carter's local node computer that has access to the global distributed cache.

Conclusion

THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Gu whose telephone number is (571) 272-0703. The examiner can normally be reached on 9am-5pm, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/SHAWN X GU/

Shawn X Gu
Patent Examiner
Art Unit 2189

15 January 2009

/Reginald G. Bragdon/
Supervisory Patent Examiner, Art Unit 2189